Safety and Buildings Division Design and Plan Review Considerations For Hazardous Materials

What types of construction should alert a designer to a potential design issue?
Design professionals should discuss with building owners or tenants if hazardous materials per IBC sections 307, 414, and 415 will be will be stored or used. Typically, flammable and combustible liquids are an important part of this analysis.

Here are some examples of occupancies that should red flag that hazardous materials are likely to be present:

- Repair or service garages
- Woodworking shops, wood fabrication plants
- School specialty areas such as chemistry labs, woodworking shops, art rooms, automotive repair shops, body shops, agriculture shops, etc.
- Physical plant storage (*University or other institutions*)
- Hazardous material storage
- Facilities involved in plastics manufacture
- Dry cleaning stores or facilities
- Storage areas in hospitals, clinics, labs, etc.
- Facilities that use organic coatings
- Storage areas in mercantile establishments that sell any kind of chemicals, sell automotive supplies, or perform service work, etc.

The building designer should request the material safety data sheet (MSDS) for each chemical with unknown properties or of concern.

Information that should be evaluated on the MSDS includes the flashpoints of the chemicals, the chemical properties (Does the chemical react with water? Is it corrosive? etc.), and the hazards the chemical presents to people.

Other key information that is relevant:

- What are the quantities of each hazardous material or flammable or combustible liquid present, whether for manufacturing process, use, or storage?
- What type/size of containers or vessels will these materials or chemicals to be stored in?
- Is the building sprinkler system protected?
- What control areas are present?
- Will the occupancy be classified as group H occupancy?
- Have the MSDS sheets available when working with the fire department and other code enforcement staff.
- Suggestion for improved site safety: Maintain any emergency contact or special information where it is readily available to fire department staff or other staff who may respond in the event of an emergency or accident within the building or area where the chemicals or materials are.

How does this impact the building plan submittal?
For purposes of building plan review and submittal, either the Control Area Worksheets or similar documentation shall be provided.

CLASSIFICATION OF SOME COMMON LIQUID BULK PRODUCTS

CLASS	PRODUCT	FLASH POINT	BOILING POINT
FLAMMABLE LIQUIDS CLASS IA	AUTOMOTIVE GASOLINE AVIATION GASOLINE JET FUEL JP-4 PENTANE VINYL CHLORIDE ETHYLENE CHLORIDE ISOPRENE PROPYLENE	BELOW 73 DEG F.	BELOW 100 DEG F.
FLAMMABLE LIQUIDS CLASS IB	ACETONE BENZENE COAL TAR OIL DENATURED ALCOHOL ACROLEIN CHLOROBENZINE METHYL ALCOHOL (METHANOL) HEXANE STYRENE METHYL ETHYL KETONE (MEK) NAPTHA, VM and P CRUDE PETROLEUM TOLUENE ETHYL ALCOHOL HEPHANE VINYL ACETATE XYLENE	BELOW 73 DEG. F.	ABOVE 100 DEG. F.
FLAMMABLE LIQUIDS CLASS IC	TURPENTINE WHISKEY	BETWEEN 73 AND 100 DEG. F.	

CLASS	PRODUCT	FLASH	BOILING

		POINT	POINT
COMBUSTIBLE LIQUIDS CLASS II	ACETIC ACID CAMPHOR OIL CELLOSOLVE SOLVENT FUEL OIL NO. 1 FUEL OIL NO. 1-D JET FUEL JP-5 JET FUEL JP-6 KEROSENE MINERAL SPIRITS NAPTHA STODDARD SOLVENT	BETWEEN 100- 140 DEG. F.	
COMBUSTIBLE LIQUIDS CLASS IIIA	BRAKE FLUID CREOSOTE PHENOL DIESEL FUEL (65 DIESEL INDEX) GAS OIL FUEL OIL NO. 2 FUEL OIL NO. 2-D FUEL OIL NO. 4 FUEL OIL NO. 5 FUEL OIL NO. 6	ABOVE 140 DEG. F. AND LESS THAN 200 DEG. F.	
THESE PRODUCTS FLASHPOINTS EXCEED 200 DEG F. CLASS IIIB	ASPHALT CASTOR OIL GEAR OIL HYDRAULIC FLUID LINSEED OIL LUBRICATING OIL MINERAL OIL MOTOR OIL NEAT'S FOOT OIL PENETRATING OIL TRANSFORMER OIL TRANSMISSION OIL EDIBLE OILS	300-550 445 450 340 535 300 380 275-600 430 295 295 310 450-640 (DEG. F.)	